# NLP150L Series

## Single and triple outputs



- **90 Vac to 264 Vac universal input range**
- **Provides low voltage outputs of 3.3 V**
- **EN61000-3-2 compliant**
- **Overvoltage and short circuit protection**
- **Power fail detection**
- **Current sharing (on $V_A$ and $V_B$)**
- **3.8 x 6.8 x 1.26 inches**
- **UL, CSA and VDE safety approvals and CE-marked to LVD**
- **Compliance to EN55022-B conducted noise standard**
- **Compliance to EN55022-A radiated noise standard**
- **Meets all applicable and relevant immunity standards EN61000-4-2, -3, -4, -5 and -6**
- **Available RoHS compliant**

The NLP150L series of 150 Watt ac-dc open-frame power supplies are available with single, triple or quad outputs. The single and triple output versions described in this datasheet are housed in a 3.8 x 6.8 x 1.26 inch package. All NLP150L series power supplies are harmonic current corrected to meet the EN61000-3-2 standard, and support current sharing. The power supplies are designed for use in 1U shelves or boxes, and are primarily intended for networking applications that have a heavy logic content, such as access concentrators, midrange routers, LAN switches and shared media hubs.

Patent No. 5600546 and 5652700

CE (LVD)

**2 YEAR WARRANTY**

***All specifications are typical at nominal input, full load at 25 °C unless otherwise stated***

## SPECIFICATIONS

### OUTPUT SPECIFICATIONS

| | | |
|---|---|---|
| Total regulation (Line and load) | Main output<br>Auxiliary outputs | ±2.0%<br>±5.0% |
| Turn-on delay | @ 120 Vac Input | 2.0 s, max. |
| Transient response | Main output 75% to 100% step at 0.1 A/µs | 5.0% or 250 mV max. dev., 1 ms max. recovery to 1% |
| Temperature coefficient | | ±0.02%/°C |
| Overvoltage protection | Main outputs | 125%, ±10% |
| Short circuit protection | Cyclic operation | Continuous |
| Minimum output current | Singles and multiple | See table |

### INPUT SPECIFICATIONS

| | | |
|---|---|---|
| Input voltage range (See Note 12) | Universal input | 90-264 Vac |
| Input frequency range | | 47-63 Hz |
| Input surge current | 264 Vac (cold start) | 40 A max. |
| Safety ground leakage current | 264 Vac, 60 Hz | 0.99 mA |
| Input current | 120 Vac @ 150 W<br>230 Vac @ 150 W | 1.95 A rms<br>1.10 A rms |
| Input fuse | UL/IEC127 | F3.15A H, 250 Vac |

### EMC CHARACTERISTICS (10)

| | | |
|---|---|---|
| Conducted emissions | EN55022, FCC part 15 | Level B |
| Radiated emissions | EN55022, FCC part 15 | Level A |
| Harmonic current emission correction | EN61000-3-2 | Compliant |
| ESD air | EN61000-4-2 | Level 3 |
| ESD contact | EN61000-4-2 | Level 3 |

### EMC CHARACTERISTICS (continued) (10)

| | | |
|---|---|---|
| Surge | EN61000-4-5 | Level 3 |
| Fast transients | EN61000-4-4 | Level 3 |
| Radiated immunity | EN61000-4-3 | Level 3 |
| Conducted immunity | EN61000-4-6 | Level 3 |

### GENERAL SPECIFICATIONS

| | | |
|---|---|---|
| Hold-up time | 120 Vac @ 60 Hz | 20 ms @ 150 W |
| Efficiency (See Note 13) | 120 Vac @ 150 W | 73% typical |
| Isolation voltage | Input/output<br>Input/chassis | 3000 Vac<br>1500 Vac |
| Approvals and standards pending | | EN60950, VDE0805, IEC950<br>UL1950, CSA C22.2 No. 950 |
| Weight | | 540 g (19 oz) |
| MTBF (@ 25 °C) | MIL-HDBK-217F<br>Bellcore | 350,000 hours min.<br>800,000 hours min. |

### ENVIRONMENTAL SPECIFICATIONS (8)

| | | |
|---|---|---|
| Thermal performance | Operating ambient, (See derating curve) | 0 °C to +50 °C |
| | Non-operating | -40 °C to +85 °C |
| | 50 °C to 70 °C ambient, convection cooled | Derate to 50% load |
| | 0 °C to 50 °C ambient, convection cooled | 110 W |
| | 0 °C to 50 °C ambient, 300 LFM forced air | 150 W |
| | Peak (0 °C to +50 °C) | (See Note 3) |
| Relative humidity | Non-condensing | 5% to 95% RH |
| Altitude | Operating<br>Non-operating | 10,000 feet max.<br>30,000 feet max. |
| Vibration (See Note 6) | 5-500 Hz | 2.4 G rms peak |
| Shock | per MIL-STD-810E | 516.4 Part IV |

# NLP150L Series

## Single and triple outputs

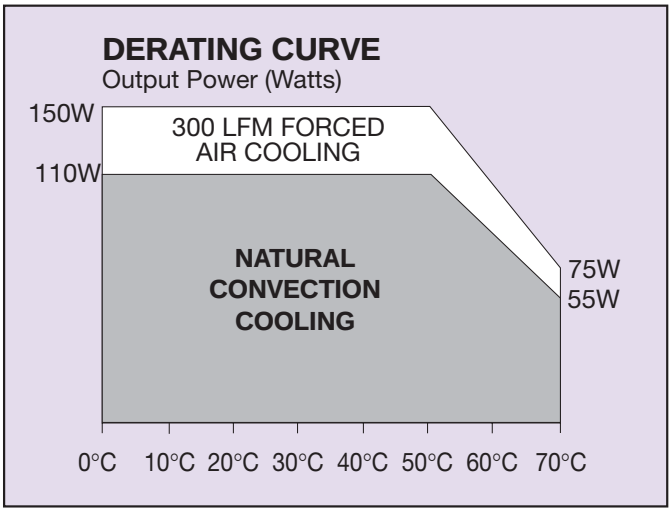


For the most current data and application support visit www.artesyn.com/powergroup/products.htm

| OUTPUT VOLTAGE | OUTPUT CURRENT | | | RIPPLE (4) | TOTAL REGULATION | MODEL NUMBERS (14,15) |
|---|---|---|---|---|---|---|
| | MIN (5) | MAX (1) | 300 LFM (2) | | | |
| 3.3 V ($V_A$) | 1 A | 22 A | 30 A | 50 mV | ±2.0% | NLP150L-96S3J |
| 5.1 V ($V_A$) | 1 A | 22 A | 30 A | 50 mV | ±2.0% | NLP150L-96S5J |
| +12 V ($V_A$) | 0.3 A | 9.2 A | 12.5 A | 120 mV | ±2.0% | NLP150L-96S6J |
| 24 V ($V_A$) | 0.15 A | 4.6 A | 6.5 A | 240 mV | ±2.0% | NLP150L-96S8J |
| 48 V ($V_A$) | 0.1 A | 2.3 A | 3.2 A | 480 mV | ±2.0% | NLP150L-96S9J |
| +5.1 V ($V_A$) | 1.5 A | 20 A | 30 A | 50 mV | ±2.0% | NLP150L-96T536J |
| +3.3 V ($V_B$) | 0.5 A | 10 A | 15 A | 50 mV | ±2.0% | |
| +12 V ($V_C$) | 0 A | 2 A | 3 A | 120 mV | ±5.0% | |
| +12 V ($V_A$) | 0.6 A | 9.2 A | 12.5 A | 120 mV | ±2.0% | NLP150L-96T658J |
| +5.1 V ($V_B$) | 0.5 A | 6 A | 8 A | 50 mV | ±2.0% | |
| +24 V ($V_C$) | 0 A | 2 A | 3 A | 240 mV | ±5.0% | |

### Notes

1. Free air convection.
   Multiple output units: maximum continuous output power not to exceed 110 W and the output current not to exceed: $I_A+I_B+2(I_C)\leq 23$ A.
2. 300 LFM forced air cooling from the longer side.
   Multiple output units: maximum continuous output power not to exceed 150 W and the output current not to exceed: $I_A+I_B+2(I_C)\leq 32$ A.
3. Peak power at 115% lasting less than 30 seconds with duty cycle less than 5%. During peak loading, output voltage may exceed total regulation limits.
4. Figure is peak-to-peak for room temperature rating. Output noise measurements are made across a 20 MHz bandwidth using a 6 inch twisted pair, terminated with a 10 µF electrolytic capacitor and a 0.1 µF ceramic capacitor.
5. Minimum load required for correct start-up and operation on single outputs and on main output of multiple versions. Failure to observe minimum load on main output will not allow the supply to start-up correctly. Some electronic test loads have a large delay time before they start drawing current even though the voltage from the supply is present. During this time delay, there is no load on the output and as a result, the supply may not be able to start-up properly and maintain its correct output voltage. In these instances, a dummy resistive load across the output may be necessary to load the output of the supply until the test load can function correctly and draw the intended minimum load. Minimum load required on auxiliary outputs to maintain regulation.
6. Three orthogonal axes, random vibration 10 minutes for each axes, 2.4 G rms 5 Hz to 500 Hz.
7. For optimum reliability no part of the heatsink should exceed 110 °C and no semi-conductor case temperature should exceed 115 °C.
8. CAUTION: Allow a minimum of 1 second after disconnecting line power when making thermal measurements.
9. This product is only for inclusion by professional installers within other equipment and must not be operated as a stand alone product.
10. Conducted EMI specifications reference measurements made with the power supply mounted on a grounded metal sheet extending 1 inch beyond each edge, using an unshielded cable. No external filtering required during conducted emissions testing but some applications may require additional filtering to achieve system compliance. Compliance with Radiated EMI specifications may require mounting in a suitable enclosure.
11. All models require a minimum mounting stand-off of 6.35 mm (0.25 inches) in the end use product.
12. Operational range 90 Vac to 264 Vac.
13. For 3.3 V ouput (single), typical efficiency is 69%.
14. The 'J' suffix indicates that these parts are Pb-free (RoHS 6/6) compliant. TSE RoHS 5/6 (non Pb-free) compliant versions may be available on special request, please contact your local sales representative for details.
15. NOTICE: Some models do not support all options. Please contact your local Artesyn representative or use the on-line model number search tool at http://www.artesyn.com/powergroup/products.htm to find a suitable alternative.




### International Safety Standard Approvals

VDE0805/EN60950/IEC950 File No. 10401-3336-0162
Licence No. 123897

UL1950 File No. E136005

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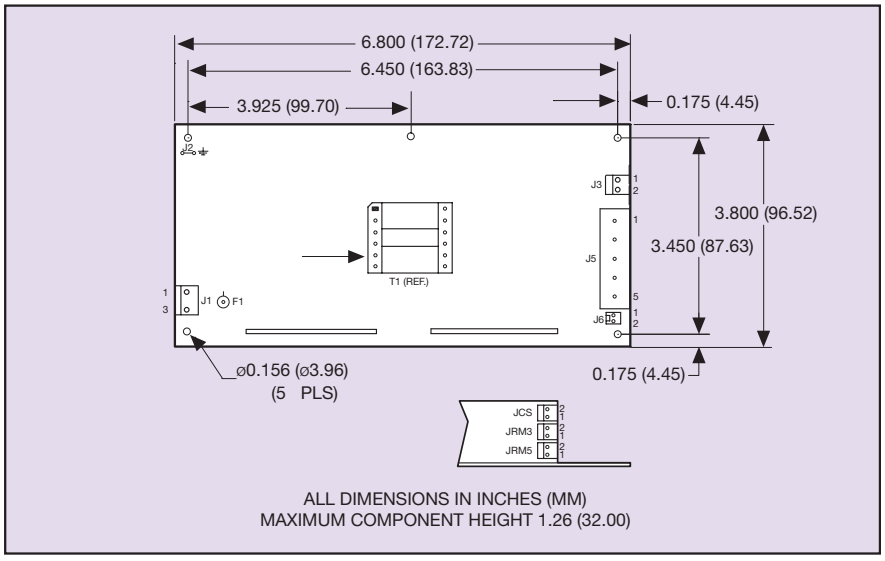
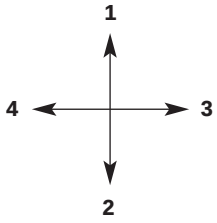
### Mechanical Notes

A All dimensions are in inches (mm).




ALL DIMENSIONS IN INCHES (MM)
MAXIMUM COMPONENT HEIGHT 1.26 (32.00)




**Recommended direction for forced air relative to power supply orientation shown below.**

1 Best.
2 Good.
3 Not recommended.
4 Not recommended.

| CONNECTOR AND MATING CONNECTOR TYPES | | |
|---|---|---|
| **CONNECTOR** | **TYPE** | **MATING CONNECTOR TYPE** |
| J1 | Molex 26-60-4030 or equivalent | Molex 09-50-3031 or equivalent with Molex 08-50-0105 or equivalent crimp terminals |
| J2 | Male 0.250 quick disconnect | Molex AA-5261, AA22-01 or equivalent |
| J3 | Molex 26-60-4040 or equivalent | Molex 09-50-3021 or equivalent with Molex 2478 phosphor bronze or equivalent crimp terminals |
| J5 | Beau Interconnect 70505-C-50 or equivalent | N/A |
| J6 | Molex 22-23-3021 or equivalent | Molex 22-01-2021 and contact 08-50-0113 terminals or equivalent |
| JRM3, JRM5 & JCS | Leoco 2421P02H000 or equivalent | Leoco 2420S02000 and contact 2453TPB00V1 |

| J1 PIN CONNECTIONS | |
|---|---|
| Pin 1 | Neutral |
| Pin 2 | Void |
| Pin 3 | Line |

| J3 PIN CONNECTIONS | |
|---|---|
| Pin 1 | $V_D$ Positive |
| Pin 2 | $V_D$ RTN |

**Note:** $V_D$ is a floating output.
It can be configured as positibe or negative

| J5 PIN CONNECTIONS | |
|---|---|
| Pin 1 | $V_A$ Positive |
| Pin 2 | $V_A$ Positive |
| Pin 3 | Main RTN |
| Pin 4 | Main RTN |
| Pin 5 | $V_B$ Positive |

| JRM5 PIN CONNECTIONS | |
|---|---|
| Pin 1 | $V_A$ Sense + |
| Pin 2 | $V_A$ Sense - |

| JRM3 PIN CONNECTIONS | |
|---|---|
| Pin 1 | $V_B$ Sense + |
| Pin 2 | $V_B$ Sense - |

| J6 PIN CONNECTIONS | |
|---|---|
| Pin 1 | Signal |
| Pin 2 | RTN |

| JCS PIN CONNECTIONS | |
|---|---|
| Pin 1 | Load A Current Sharing |
| Pin 2 | Load B Current Sharing |

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